Supporting Information

For

Phenotyping and Genotyping of Antibiotic-resistance *Escherichia coli* Isolated from Beijing River Basin, North China

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Text	17
Figures	3
Tables	3
Words	3143

Isolation Procedure of E. coli. Water samples were 10 × fold serial diluted and 0.1 mL of each dilution was filtered through nitrocellulose filters (0.47 μm pore-size, 47 mm diameter, Millipore Corporation, America) with the goal of obtaining 30 to 50 colonies per filter. The filters placed onto *E. coli* chromogenic agar (Chromagar Microbiology, France) and incubated at 44°C for 24 h. After 24 h of incubation, colonies that turned blue on *E. coli* chromogenic agar were chosen and streaked onto LB agar (BD, America), and then incubated at 37°C for 24 h. Approximately 40 isolates were collected with dilution method using 6 - 8 disks for each water sample, and their antibiotic susceptibilities were tested. To avoid the clones, all isolates were randomly chosen from independent colonies growing on the disks and the number of selected isolates from each disk was less then 10. The pure cultures were then used to inoculate 1% tryptone water (Oxoid, UK) and EC broth containing 4-methylumbelliferyl-D-glucuronide (Oxoid, UK) and incubated for 24 h at 37 and 44°C, respectively. Isolates that produced indole from tryptophan and that were positive for gas production and fluorescence in EC broth containing 4-methylumbelliferyl-D-glucuronide were designated as *E. coli* isolates and used for subsequent studies (*31, 32*).

TABLE S1. PCR Primers used in this study.

	Primers	Target	Sequence (5′- 3′)	Annealing temperature(°C)	Amplicon size (bp)	Reference
A	*tet*(B)/P-FW *tet*(B)/P-RV	*tet*(B/P)	AAAACTTATTATATTATAGTG TGGAGTATCAATAATATTCAC	46	169	(11)
	tet(M)-FW *tet*(M)-RV	*tet*(M)	ACAGAAAGCTTATTATATAAC TGGCGTGTCTATGATGTTCAC	55	171	(11)
	tet(O)-FW *tet*(O)-RV	*tet*(O)	ACGGARAGTTTATTGTATACC TGGCGTATCTATAATGTTGAC	60	171	(11)
	tet(Q)-FW *tet*(Q)-RV	*tet*(Q)	AGAATCTGCTGTTTGCCAGTG CGGAGTGTCAATGATATTGCA	63	169	(11)
	tet(S)-FW *tet*(S)-RV	*tet*(S)	GAAAGCTTACTATACAGTAGC AGGAGTATCTACAATATTTAC	50	169	(11)
	tet(T)-FW *tet*(T)-RV	*tet*(T)	AAGGTTTATTATATAAAAGTG AGGTGTATCTATGATATTTAC	46	169	(11)
	tet(W)-FV *tet*(W)-RV	*tet*(W)	GAGAGCCTGCTATATGCCAGC GGGCGTATCCACAATGTTAAC	64	168	(11)
	OTR-FW OTR-RV	*Otr*(A)	GGCATYCTGGCCCACGT CCCGGGGTGTCGTASAGG	66	212	(11)
B	*tet*(A)-FW *tet*(A)-RV	*tet*(A)	GCGCGATCTGGTTCACTCG AGTCGACAGYRGCGCCGGC	61	164	(12)
	tet(B)-FW *tet*(B)-RV	*tet*(B)	TACGTGAATTTATTGCTTCGG ATACAGCATCCAAAGCGCAC	61	206	(12)
	tet(C)-FW *tet*(C)-RV	*tet*(C)	GCGGGATATCGTCCATTCCG GCGTAGAGGATCCACAGGACG	68	207	(12)
	tet(D)-FW *tet*(D)-RV	*tet*(D)	GGAATATCTCCCGGAAGCGG CACATTGGACAGTGCCAGCAG	68	187	(12)
	tet(E)-FW *tet*(E)-RV	*tet*(E)	GTTATTACGGGAGTTTGTTGG AATACAACACCCACACTACGC	61	199	(12)
	tet(G)-FW *tet*(G)-RV	*tet*(G)	CCYGCAAGAGAAGCCAGAAG CCTTCTCGACCAGGTCGG	68	134	(12)
	tet(H)-FW *tet*(H)-RV	*tet*(H)	CAGTGAAAATTCACTGGCAAC ATCCAAAGTGTGGTTGAGAAT	61	185	(12)
	tet(J)-FW *tet*(J)-RV	*tet*(J)	CGAAAACAGACTCGCCAATC TCCATAATGAGGTGGGGC	61	184	(12)
	tet(L)-FW *tet*(L)-RV	*tet*(L)	GATTGGAGTTCTTTGTGGGG CAATTGCAATACCTGTTCCC	434	55	(35)
	tet(Y)-FW *tet*(Y)-RV	*tet*(Y)	ATTTGTACCGGCAGAGCAAAC GGCGCTGCCGCCATTATGC	68	181	(12)
	tet(Z)-FW *tet*(Z)-RV	*tet*(Z)	CCTTCTCGACCAGGTCGG ACCCACAGCGTGTCCGTC	61	204	(12)
	tet(30)-FW *tet*(30)-RV	*tet*(30)	CATCTTGGTCGAGGTGACTGG ACGAGCACCCAGCCGAGC	68	134	(12)
C	*sul*(I)-FW *sul*(I)-RV	*sul*(I)	CGCACCGGAAACATCGCTGCAC TGAAGTTCCGCCGCAAGGCTCG	55.9	163	(14)
	sul(II)-FW *sul*(II)-RV	*sul*(II)	TCCGGTGGAGGCCGGTATCTGG CGGGAATGCCATCTGCCTTGAG	60.8	191	(14)
	sul(III)-FW *sul*(III)-RV	*sul*(III)	TCCGTTCAGCGAATTGGTGCAG TTCGTTCACGCCTTACACCAGC	60	128	(14)

CONTIUE TO TABLE S1. PCR Primers used in this study.

	Primers	Target	Sequence (5′- 3′)	Annealing temperature(°C)	Amplicon size (bp)	Reference
D	*TEM*-FW *TEM*-RV	*TEM*	AAAGATGCTGAAGATCA TTTGGTATGGCTTCATTC	44	425	(16)
	SHV-FW *SHV*-RV	*SHV*	GCGAAAGCCAGCTGTCGGGC GATTGGCGGCGCTGTTATCGC	62	304	(16)
	CARB-FW *CARB* -RV	*CARB*	CAAGTACTTTYAAAACAATAGC GCTGTAATACTCCKAGCAC	46	534	(16)

A: Tetracycline resistance genes Encoding Ribosomal Protection Proteins; B: Encoding Tetracycline Efflux Genes; C: encoding sulfonamide resistance gene; D: encoding β-lactamases gene. NA: Not applicable

TABLE S2. Detection of Resistance Genes among from Antibiotic-resistance *E.coli* isolates from Beijing River Basin

	Season	Site	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
01	Summer	A	AMP, TC, SXT	+	-	+	-	+	+	+
02	Summer	A	AMP, TC, SXT, LEV	-	-	-	+	+	-	+
03	Summer	A	AMP, TC, SXT, LEV, CN	+	+	-	+	+	-	+
04	Summer	A	AMP, TC, SXT	+	-	+	+	-	-	+
05	Summer	B	AMP, TC, SXT, LEV	+	+	-	+	-	-	+
06	Summer	B	AMP, TC, SXT	-	+	-	+	+	-	+
07	Summer	B	AMP, TC, SXT	+	-	-	+	+	-	+
08	Summer	B	AMP							+
09	Summer	B	AMP,SXT				+	+	-	+
10	Summer	D	AMP, TC, SXT	+	-	-	-	+	-	+
11	Summer	D	SXT				+	+	-	
12	Summer	E	AMP, TC, SXT	+	+	-	+	+	-	+
13	Summer	E	AMP, TC, SXT, LEV, CN	+	-	-	-	-	+	+
14	Summer	E	AMP,TC,SXT,CN,KZ	-	+	-	+	+	-	+
15	Summer	E	AMP, TC, SXT, LEV, CN	-	+	-	+	+	-	+
16	Summer	E	AMP,TC,SXT,KZ, MA,CFP	-	+	-	+	+	-	+
17	Summer	E	AMP,TC,MA,KZ	-	+	+				+
18	Summer	F	AMP, TC, SXT	+	+	-	+	-	-	+
19	Summer	F	AMP,TC,SXT,KZ,MA	-	-	-	+	+	-	+
20	Summer	F	AMP,TC,SXT,LEV,CN	+	-	-	+	+	-	+
21	Summer	F	AMP,TC,SXT,CN	+	+	-	+	+	-	+
22	Summer	F	AMP,TC,SXT	+	-	-	+	-	-	+
23	Summer	F	AMP,TC,SXT,CN	+	-	-	+	+	-	+
24	Summer	F	AMP,SXT	-	-	-	+	+	-	+
25	Summer	G	AMP,TC.SXT	-	+	+	-	-	-	+

+: present; -: absent

CONTIUE TO TABLE S2. Detection of Resistance Genes among from Antibiotic-resistance *E.coli* isolates from Beijing River Basin

	Season	Site	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
26	Summer	G	AMP,TC,SXT,CN	+	-	-	-	-	+	+
27	Summer	G	AMP,TC,SXT,CN	+	+	-	+	+	-	+
28	Summer	G	TC,SXT	+	-	-	-	+	-	
29	Summer	G	AMP,TC,SXT,CN	+	-	+	-	+	-	+
30	Summer	G	AMP,TC	+	-	-	-	-	-	+
31	summer	G	TC	+	-	-				
32	Summer	G	AMP,TC,SXT	+	-	-	-	-	-	+
33	Summer	H	TC,SXT	+	-	-	+	-	-	
34	Summer	H	AMP,TC.SXT.LEV	-	+	-	+	-	-	+
35	Summer	H	AMP,TC,SXT	+	+	-	-	-	-	+
36	Summer	H	AMP,TC,SXT	-	-	-	-	+	-	+
37	Summer	H	TC,SXT	+		+	+			
38	Summer	H	TC,SXT				+	+		
39	Summer	I	AMP,TC,SXT	+	-	-	+	+	+	+
40	Summer	I	AMP,TC,SXT	+	-	-	+	-	-	+
41	Summer	I	AMP,TC,SXT,LEV,KZ,MA	+	-	-	-	+	+	+
42	Summer	I	AMP,TC,SXT	-	+	-	-	-	-	+
43	Summer	J	TC,SXT	-	+	+	+	-	-	
44	Summer	J	TC,SXT	+	-	+	-	+	-	
45	Summer	K	AMP,TC,SXT,CN	-	-	+	+	+	-	+
46	Summer	K	AMP							-
47	Summer	K	AMP,TC	+	+	-				+
48	Summer	K	AMP,TC	-	-	-				+
49	Summer	K	AMP,TC,SXT,CN	-	+	+	+	+	-	+
50	Summer	K	AMP,TC,SXT,CN	+	-	+	+	+	-	+

+: present; -: absent

CONTIUE TO TABLE S2. Detection of Resistance Genes among from Antibiotic-resistance *E.coli* isolates from Beijing River Basin

	Season	Site	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
51	Summer	K	AMP,TC,SXT,CN	-	-	-	+	+	-	+
52	Winter	A	TC, SXT, LEV	-	-	-	+	-	-	
53	Winter	A	AMP							+
54	Winter	A	TC,SXT	+	-	-	+	+	-	
55	Winter	A	SXT				+	+	+	
56	Winter	A	TC	-	-	-				
57	Winter	A	TC	-	+	-				
58	winter	B	TC	-	+	-				
59	Winter	B	AMP, TC, SXT, LEV	+	-	-	+	+	-	+
60	winter	B	TC	+	-	-				
61	Winter	B	AMP, TC, SXT, LEV	+	-	-	+	-	-	+
62	Winter	B	AMP							+
63	Winter	B	AMP, TC, SXT	-	+	+	+	+	-	+
64	winter	B	TC	+	-	-				
65	winter	B	TC	+	-	-				
66	Winter	B	AMP, TC, SXT,CN	-	+	-	+	+	-	+
67	Winter	C	AMP, TC, SXT, LEV	+	-	-	+	+	-	+
68	Winter	C	AMP,KZ,MA							+
69	Winter	C	AMP,KZ,CFP,MA							+
70	Winter	C	AMP, TC, SXT, LEV	+	-	-	+	+	-	+
71	Winter	C	AMP,SXT				-	+	-	+
72	Winter	C	AMP,SXT,KZ,MA,CN				+	-	-	+
73	Winter	C	AMP,SXT,CN				+	+	+	+
74	Winter	C	TC,SXT	+	-	-	+	+	-	
75	Winter	C	TC,SXT	-	+	-	+	+	-	

+: present; -: absent

CONTIUE TO TABLE S2. Detection of Resistance Genes among from Antibiotic-resistance *E.coli* isolates from Beijing River Basin

	Season	Site	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
76	winter	C	TC	-	+	-				
77	winter	C	TC	-	+	-				
78	winter	C	TC	+	-	-				
79	winter	C	TC	-	+	-				
80	Winter	D	AMP, TC, SXT, LEV, CN	+	-	-	+	+	+	+
81	Winter	D	TC, SXT, LEV, CN	-	+	-	+	+	+	
82	Winter	D	AMP, TC, SXT, LEV, CN	+	+	-	+	+	+	+
83	Winter	D	AMP,KZ							+
84	Winter	D	AMP,KZ,MA							+
85	Winter	D	AMP,TC,KZ	+	-	-				+
86	Winter	D	AMP,TC	-	+	-				+
87	Winter	D	AMP,TC,SXT,KZ,MA,CN	+	+	+	+	+	-	+
88	Winter	D	TC,SXT	+	-	-	+	+	-	
89	winter	D	TC	+	+	-				
90	winter	D	TC	-	+	-				
91	winter	D	TC	+	-	-				
92	Winter	E	AMP, TC, SXT, LEV, CN	+	+	-	+	+	-	+
93	Winter	E	AMP, TC, SXT, LEV, CN	+	-	-	+	+	-	+
94	Winter	E	AMP, TC, SXT, LEV, CN	+	+	-	+	+	-	+
95	Winter	E	TC,SXT,CN	+	-	-	+	+	-	
96	winter	E	TC	+	-	-				
97	winter	E	TC	+	-	-				
98	winter	E	TC	-	+	-				
99	Winter	L	AMP, TC, SXT, LEV	-	+	-	+	+	-	+
100	Winter	L	AMP,TC, SXT, LEV, CN	+	-	-	+	+	-	+

+: present; -: absent

CONTIUE TO TABLE S2. Detection of Resistance Genes among from Antibiotic-resistance *E.coli* isolates from Beijing River Basin

	Season	Site	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
101	Winter	L	AMP, TC, SXT, LEV	+	+	-	+	+	-	+
102	Winter	L	AMP, TC, SXT, LEV	+	-	-	+	+	-	+
103	Winter	L	AMP, TC, SXT, LEV, CN	+	-	-	+	+	-	+
104	Winter	L	AMP							+
105	Winter	L	AMP							-
106	Winter	L	AMP,TC	+	-	+				+
107	Winter	L	AMP,TC,KZ,MA	+	-	+				+
108	Winter	L	AMP,SXT,LEV				+	-	+	+
109	Winter	L	TC,SXT	+	+	-	+	+	+	

+: present; -: absent

AMP: Ampicillin; TC: Tetracycline; SXT: Sulfamethoxazole/trimethoprim; LEV: Levofloxacin; KZ: Cefazolin; MA: Cefamandole; CFP: Cefoperazone; IPM: Imipenem; CN: Gentamicin

TABLE S3. Detection of Resistance Genes among Antibiotic-resistance *E.coli* Isolats from animal source and Domestic Wastewater*. from Sewage Treatment Plant.

	Source	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
01	A	AMP,TC,SXT	-	+	-	+	-	-	+
02	A	AMP							+
03	A	AMP,TC	-	+	-				+
04	A	AMP,TC	-	+	-				+
05	A	AMP,TC,SXT	+	+	-	+	+	+	+
06	A	AMP,TC,SXT	+	-	-	+	+	-	+
07	A	AMP,LEV,CN							+
08	A	AMP,TC,SXT,LEV	+	-	+	-	-	+	+
09	A	AMP,TC	-	+	-				+
10	A	AMP,TC,SXT,CN	+	-	-	+	+	-	+
11	A	AMP,TC	-	+	-				+
12	A	AMP,TC,SXT	-	+	-	-	-	+	+
13	A	AMP,TC,SXT,CN	+	-	-	-	+	+	+
14	A	AMP,TC.SXT	-	+	-	-	+	+	+
15	A	AMP,TC	-	+	-				+
16	A	AMP,TC,SXT	-	+	-	-	+	+	+
17	A	AMP,TC,SXT,LEV,CN	+	-	-	+	-	+	+
18	A	AMP,TC,SXT	+	-	-	+	+	+	+
19	A	AMP,TC,LEV,CN	-	+	-				+
20	A	AMP,TC,SXT	-	+	-	-	-	-	+
21	A	AMP,TC,SXT	+	+	-	+	-	+	+
22	A	AMP,TC,SXT	+	-	-	+	-	-	+
23	A	AMP,TC,SXT,LEV,CN	+	-	-	-	+	+	+
24	A	AMP,TC	-	+	-				+

+: present; -: absent

CONTIUE TO TABLE S3. Detection of Resistance Genes among Antibiotic-resistance *E.coli* Isolats from animal source and Domestic Wastewater*. from Sewage Treatment Plant.

	Source	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
25	A	AMP,TC	-	+	-				+
26	A	AMP,TC,SXT	-	-	-	-	+	-	+
27	A	AMP,TC,SXT,LEV	-	+	-	-	-	+	+
28	A	AMP,TC,SXT,LEV	-	-	-	-	+	+	+
29	A	AMP,TC,SXT,LEV,CN	-	-	-	-	-	+	+
30	A	AMP,TC,SXT,LEV,CN	-	-	-	-	+	-	+
31	B	AMP,TC,SXT,LEV,CN	+	-	-	+	+	-	+
32	B	AMP,TC,SXT,LEV	-	+	-	+	-	-	+
33	B	SXT,LEV				+	+	-	
34	B	AMP,TC,SXT,LEV,CN	+	-	-	-	+	+	+
35	B	TC,SXT	-	+	-	-	-	+	
36	B	AMP,TC,SXT,LEV,CN	-	+	-	-	+	-	+
37	B	AMP,TC	+	-	-				+
38	B	AMP,SXT,LEV				-	+	-	+
39	B	AMP,TC,SXT,CN	-	+	-	+	+	-	+
40	B	AMP,TC,SXT,LEV	-	+	-	+	+	-	+
41	B	TC,LEV	-	-	-				
42	B	TC	-	-	-				
43	B	AMP,TC,SXT,LEV	-	+	-	+	-	-	+
44	B	AMP,TC,SXT,LEV,CN	+	-	-	+	+	-	+
45	B	AMP,TC,SXT,LEV	-	-	-	+	+	-	+
46	B	AMP,SXT,LEV				+	-	-	+
47	B	AMP,SXT,LEV				+	-	-	+
48	B	AMP,TC,LEV	-	+	-			-	+

+: present; -: absent

CONTIUE TO TABLE S3. Detection of Resistance Genes among Antibiotic-resistance *E.coli* Isolats from animal source and Domestic Wastewater*. from Sewage Treatment Plant.

	Source	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
49	B	SXT,LEV				-	+	-	
50	B	SXT,LEV				+	+	-	
51	B	AMP,TC,SXT	-	+	-	-	+	+	+
52	B	TC,SXT,	+	-	-	-	+	-	
53	B	AMP,TC,SXT,LEV,CN	-	+	-	+	+	-	+
54	B	AMP,TC,SXT,	-	-	-	+	+	-	+
55	B	TC,SXT	+	-	-	+	+	-	+
56	B	TC,SXT,LEV	+	-	-	+	+	-	+
57	B	TC	+	-	-				
58	B	AMP,TC,SXT,LEV,CN	-	+	-	+	+	-	+
59	B	AMP,TC,SXT,LEV	+	+	-	+	+	-	+
60	B	AMP,TC,SXT	+	-	-	+	+	-	+
61	B	AMP,TC,SXT,LEV	-	-	-	-	+	-	+
62	B	AMP,TC,SXT,CN	+	+		+	+	-	+
63	B	AMP							+
64	C	TC	+	+	-				
65	C	AMP,TC,SXT,CN	+	-	-	-	+	-	+
66	C	TC	+	-	-				
67	C	AMP,TC,SXT	-	+	-	+	+	+	-
68	C	AMP,TC,SXT	-	-	-	+	+	-	-
69	C	AMP,TC,SXT	+	-	-	+	+	+	-
70	C	AMP,TC,SXT	+	+	-	+	+	+	+
71	C	AMP,TC,SXT,LEV,CN	-	-	-	+	+	-	-
72	C	AMP,TC,SXT	-	-	-	+	-	-	-

+: present; -: absent

CONTIUE TO TABLE S3. Detection of Resistance Genes among Antibiotic-resistance *E.coli* Isolats from animal source and Domestic Wastewater*. from Sewage Treatment Plant.

	Source	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
73	C	AMP,TC,SXT	+	-	-	+	+	+	-
74	C	AMP,TC,SXT	-	-	-	+	+	+	-
75	C	TC	+	-	-				
76	C	AMP,TC,SXT	+	-	-	+	+	+	-
77	C	AMP,TC,SXT,LEV	-	+	-	+	+	+	-
78	C	AMP,TC,SXT	+	-	-	-	+	-	+
79	C	AMP,TC	+	+	-				+
80	C	TC	+	-	-				
81	C	AMP,TC,SXT,LEV,CN	+	-	-	+	+	+	+
82	C	TC,SXT	+	-	-	+	+	-	
83	C	TC,SXT,LEV	+	-	-	+	+	+	
84	C	AMP,TC,SXT	+	-	-	+	+	-	+
85	C	AMP,TC,SXT,LEV,CN	-	-	-	+	+	-	+
86	C	AMP,TC,SXT	+	-	-	+	-	-	+
87	C	AMP,TC	-	-	-				+
88	C	AMP,TC,SXT,CN	+	-	-	+	+	+	+
89	C	AMP,TC,SXT,LEV	+	-	-	+	+	-	+
90	C	AMP,TC,SXT	+	-	-	+	+	+	+
91	C	AMP,TC,SXT,LEV	-	-	-	+	+	-	-
92	C	TC,SXT	+	+	-	+	+	-	
93	C	AMP,TC,LEV	-	-	-	-	-	-	-
94	C	AMP,TC,SXT	-	-	-	-	+	+	+
95	C	AMP,TC,SXT,LEV	-	-	-	-	+	+	+
96	C	AMP,TC,SXT,LEV	-	-	-	+	+	+	+

+: present; -: absent

CONTIUE TO TABLE S3. Detection of Resistance Genes among Antibiotic-resistance *E.coli* Isolats from animal source and Domestic Wastewater*. from Sewage Treatment Plant.

	Source	Resistance pattern	*tet*(A)	*tet*(B)	*tet*(M)	*sul*(I)	*sul*(II)	*sul*(III)	*TEM*
97	C	TC	+	+	-				
98	C	AMP,TC,SXT	-	-	-	+	+	-	+
99	C	AMP,TC,SXT,CN	+	-	-	+	+	+	+
100	C	TC,SXT	-	-	-	+	+	-	
101	C	AMP,TC	+	+	-				+
102	C	AMP,TC	+	-	-				-
103	C	AMP,TC	+	-	-				+
104	C	AMP,TC	+	-	-				+
105	C	AMP,TC,SXT	-	+	-	+	+	+	-
106	C	TC,SXT	+	-	-	-	+	+	
107	C	AMP,TC,SXT	-	+	-	+	+	+	-

+: present; -: absent

A: swine; B: human; C: chicken; AMP: Ampicillin; TC: Tetracycline; SXT: Sulfamethoxazole/trimethoprim; LEV: Levofloxacin; KZ: Cefazolin; MA: Cefamandole; CFP: Cefoperazone; IPM: Imipenem; CN: Gentamicin; *Wastewater from Fangzhuang Sewage Treatment Plant in Figure 1.

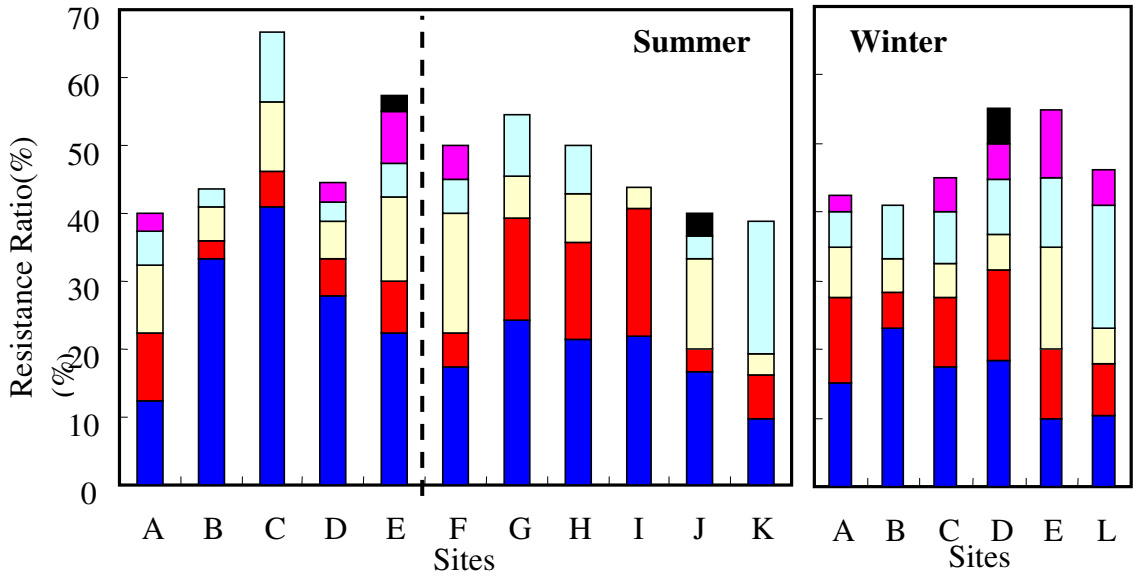

FIGURE S1. Profiles of antibiotic-resistance *E.coli* isolated from the Wenyu River Basin. One-drug resistance; two-drug resistance; three-drug resistance; four-drug resistance; five-drug resistance; six-drug resistance.

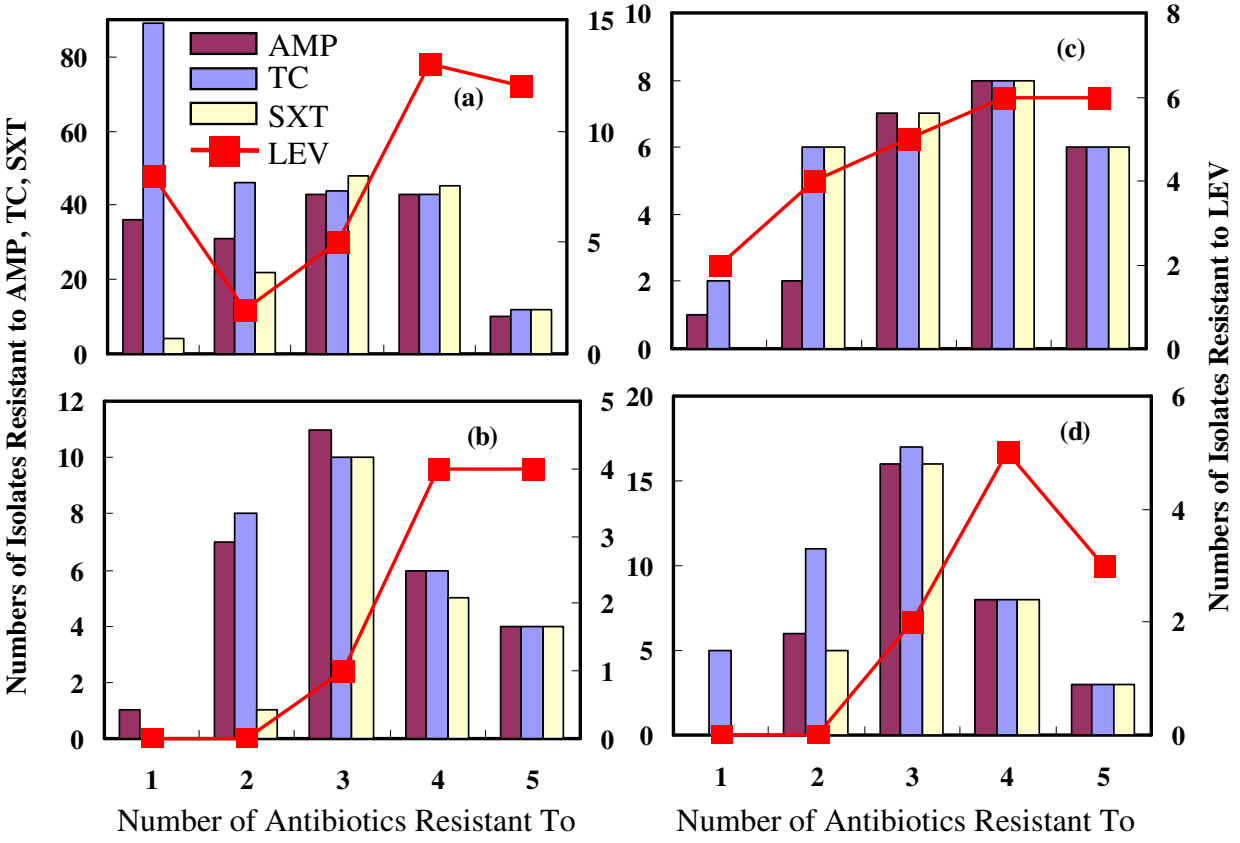

FIGURE S2. Comparison of spectrum of AMP, TC, TMP-SXT, and LEV resistance *E.coli* isolates from Beijing river basin with feedlot and domestic wastewater. AMP: Ampicillin; TC: tetracycline; SXT: sulfamethoxazole-trimethoprim; LEV: levofloxacin. (a) Beijing river basin; 294 antibiotic resistance isolates screened from 624 *E.coli* isolates; (b) swine source; 30 antibiotic resistance isolates screened from 31 *E.coli* isolates; (c) human source from Fangzhuang sewage treatment plant; 36 antibiotic resistance isolates screened from 107 *E.coli* isolates; (d) chicken source; 44 antibiotic resistance isolates screened from 45 *E.coli* isolates.

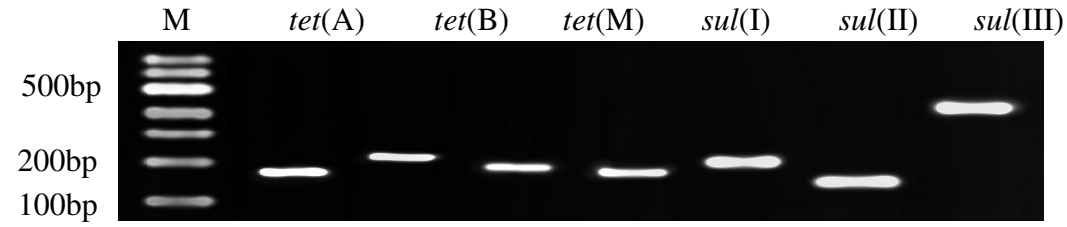

FIGURE S3. Detection of resistance genes coding for tetracycline, sulfonamide and β-Lactam resistance using DNAs from *E.coli* isolated from Wenyu River Basin.